

I (WE) CLAIM:

1. A method for controlling a transmit spectrum in medical imaging, the method comprising:
 - (a) transmitting at least three waveforms from three elements, respectively, in a transmit event;
 - (b) applying relative focusing delays or phase shifts to the at least three waveforms for (a); and
 - (c) applying additional delays or phase shifts between the at least three waveforms for (a) such that each of the at least three waveforms is associated with a different amount of delay or phase shift in addition to the focusing delays or phase shifts.
2. The method of Claim 1 wherein (b) comprises applying relative focusing delays and wherein (c) comprises applying additional delays.
3. The method of Claim 1 wherein (a) comprises transmitting the at least three waveforms wherein each of the waveforms has fewer than seven amplitude levels.
4. The method of Claim 3 wherein (a) comprises transmitting bipolar waveforms.
5. The method of Claim 3 wherein (a) comprises transmitting unipolar waveforms.
6. The method of Claim 1 further comprising:
 - (d) repeating (a), (b) and (c) for the transmit event across an array of elements including the three elements.
7. The method of Claim 6 wherein (c) comprises:

(c1) applying an about one quarter period delay to about a first quarter of the elements;

(c2) applying an about negative one quarter period delay to about a second quarter of the elements, the first quarter being different elements than the second quarter; and

(c3) maintaining about half the elements free of additional delays, the about half being different elements than the first and second quarters.

8. The method of Claim 6 wherein (a) comprises transmitting four waveforms, wherein (b) comprises applying to the four waveforms, wherein (c) comprises adding four different delays or phase shifts respectively to the four waveforms in addition to the relative focusing delays or phase shifts.

9. The method of Claim 1 wherein the different amount of delay in addition to the focusing delays for one of the at least three waveforms is substantially no additional delay.

10. The method of Claim 1 further comprising:

(d) inverting at least one of the at least three waveforms.

11. A system for controlling a transmit spectrum in medical imaging, the system comprising:

an array of transducer elements;

a transmit beamformer connectable with the array and operable to relatively delay signals from at least three channels by focusing delays and additional relative delays such that each of the at least three channels is associated with a different amount of delay in addition to the focusing delays, the additional relative delay of signals being in a pattern across the array.

12. The system of Claim 11 wherein the transmit beamformer comprises a bipolar transmitter.

13. The system of Claim 11 wherein the transmit beamformer comprises a unipolar transmitter.

14. The system of Claim 11 wherein the transmit beamformer is operable to apply an about one quarter period delay to about a first quarter of the elements, apply an about negative one quarter period delay to about a second quarter of the elements, the first quarter being different elements than the second quarter, and maintain about half the elements free of additional delays, the about half being different elements than the first and second quarters.

15. The system of Claim 11 wherein the transmit beamformer is operable to inverse signals for at least one of the at least three channels.

16. The system of Claim 11 wherein the pattern of additional relative delays is a repeating pattern

17. A method for controlling a transmit spectrum in medical imaging, the method comprising:

- (a) transmitting at least two waveforms from two elements, respectively, in a transmit event;
- (b) applying relative focusing delays or phase shifts to the at least two waveforms for (a); and
- (c) applying an additional delay or phase shift and a sign change between the at least two waveforms for (a).

18. The method of Claim 17 wherein (b) comprises applying relative focusing delays and wherein (c) comprises applying an additional delay.

19. The method of Claim 17 wherein (a) comprises transmitting the at least two waveforms wherein each of the waveforms has fewer than seven amplitude levels.

20. The method of Claim 19 wherein (a) comprises transmitting one of: bipolar and unipolar waveforms.
21. The method of Claim 17 further comprising:
- (d) repeating (a), (b) and (c) for the transmit event across an array of elements including the two elements.
22. The method of Claim 21 wherein (c) comprises:
- (c1) inverting a first of the at least two waveforms; and
 - (c2) delaying the first waveform relative to a second of the at least two waveforms by an about one half period delay.
23. The method of Claim 21 wherein (a) comprises transmitting three waveforms, wherein (b) comprises applying to the three waveforms, and wherein (c) comprises:
- (c1) maintaining about half the elements of the array free of additional delays;
 - (c2) inverting and delaying by about one half a period of a center frequency for about a first quarter of the elements, the first quarter being different elements than the half; and
 - (c3) inverting and advancing by about one half a period of the center frequency for about a second quarter of the elements, the second quarter being different elements than the first quarter and the half.
24. A system for controlling a transmit spectrum in medical imaging, the system comprising:
- an array of transducer elements;
 - a transmit beamformer connectable with the array and operable to relatively delay signals from at least two channels by focusing delays, an additional relative delay and a sign change, the additional relative delay of signals being in a pattern across the array.

25. The system of Claim 24 wherein the transmit beamformer comprises one of: a bipolar transmitter and a unipolar transmitter.
26. The system of Claim 24 wherein the transmit beamformer is operable to invert a first of the at least two waveforms and delay the first waveform relative to a second of the at least two waveforms by an about one half period delay.
27. The system of Claim 24 wherein the transmit beamformer is operable to apply the repeating pattern over at least three channels, operable to maintain about half the elements of the array free of additional delays, operable to invert and delay by about one half a period of a center frequency for about a first quarter of the elements, the first quarter being different elements than the half, and operable to invert and advance by about one half a period of the center frequency for about a second quarter of the elements, the second quarter being different elements than the first quarter and the half.